Air Quality Modeling Analysis

In accordance with the Prevention of Significant Deterioration (PSD) rules in 40 CFR § 52.21 and ACHD Article XXI §2102.07(a), Allegheny Energy Center LLC has conducted an air quality analysis which utilizes dispersion modeling. Allegheny Energy Center's air quality analysis satisfies the requirements of the PSD rules and is consistent with the U.S. Environmental Protection Agency's (EPA) *Guideline on Air Quality Models* (40 CFR Part 51, Appendix W) and the EPA's air quality modeling policy and guidance.

In accordance with 40 CFR § 52.21(k), Allegheny Energy Center's air quality analysis demonstrates that the proposed emissions from Allegheny Energy Center's facility would not cause or contribute to air pollution in violation of the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than or equal to 2.5 micrometers in diameter (PM-2.5), or particulate matter less than or equal to 10 micrometers in diameter (PM-10).

Allegheny County is designated as nonattainment for the 2012 annual particulate matter less than or equal to 2.5 micrometers in diameter (PM-2.5) NAAQS. Sections of Allegheny County are also designated as nonattainment for the 1997 24-hour $PM_{2.5}$ NAAQS; however, the Elizabeth Township is not one of those sections. As a result, PM-2.5 is regulated by the Nonattainment New Source Review (NNSR) permitting program. Allegheny Energy Center's proposed PM-2.5 emissions are below the major source NNSR emissions threshold of 100 tons per year (tpy) and therefore is not subject to NNSR permitting requirements. However, ACHD requested a PM-2.5 air quality modeling demonstration be completed to evaluate impacts to the PM-2.5 nonattainment areas.

A summary of the Class II significant impact level (SIL) air quality modeling analysis and subsequent NAAQS air quality modeling demonstration is provided in the following tables:

Table 1 – Allegheny Energy Center SIL Analysis Air Quality Modeling Results

Pollutant	Averaging Period	AEC Class II SIL Impact	Class II SIL
		micrograms per cubic meter	micrograms per cubic meter
CO	1-Hour	639.55867	2,000
	8-Hour	363.09435	500
NO_2	1-Hour	28.94776[(a)]	7.5
	Annual	0.42440	1.0
PM-2.5	24-Hour	0.99406	1.2
	Annual	0.08367	0.2
PM-10	24-Hour	1.59703	5.0
	Annual	0.08856	1.0

(a) Allegheny Energy Center's impact greater than Class II SIL therefore NAAQS and PSD increment air quality modeling demonstrations were also completed.

Table 2 – Allegheny Energy Center NAAQS Air Quality Modeling Demonstration

Pollutant	Averaging Period	Combined Impact[(a)(b)]	NAAQS
		micrograms per cubic meter	micrograms per cubic meter
NO_2	1-Hour	62.2	188.0

(a) AEC contribution combined with background concentration from the Charleroi NO_2 ambient monitor (42-125-0005).

(b) Local sources were also evaluated, and a significant contribution analysis was completed that demonstrated that the contribution of NO_2 concentrations due to AEC-only sources does not cause or contribute to violations of the 1-hour NO_2 NAAQS.

Allegheny Energy Center's air quality analysis demonstrates that the proposed emissions from Allegheny Energy Center's facility would not cause or contribute to air pollution in violation of the increments for NO_2, PM-2.5, or PM-10. The degree of Class II and Class I increment consumption expected to result from the operation of Allegheny Energy Center's facility is provided in the following tables:

Table 3 – Degree of Class II Increment Consumption from Operation of Allegheny Energy Center's Facility

Pollutant	Averaging Period	Degree of Class II Increment Consumption		Class II Increment
		micrograms per cubic meter	% of Class II Increment	micrograms per cubic meter
NO_2	Annual	< 0.42736	< 1.71 %	25
PM-2.5	24-Hour	< 0.99411	< 11.05 %	9
	Annual	< 0.08367	< 2.09 %	4
PM-10	24-Hour	< 1.59703	< 5.32 %	30
	Annual	< 0.08856	< 0.52 %	17

Table 4 – Degree of Class I Increment Consumption from Operation of Allegheny Energy Center's Facility

Pollutant	Averaging Period	Degree of Class I Increment Consumption		Class I Increment
		micrograms per cubic meter	% of Class I Increment	micrograms per cubic meter
NO_2	Annual	< 0.01061	< 0.42 %	2.5
PM-2.5	24-Hour	< 0.06632	< 3.32 %	2
	Annual	< 0.00712	< 0.71 %	1
PM-10	24-Hour	< 0.10347	< 1.29 %	8
	Annual	< 0.00713	< 0.18 %	4

In accordance with 40 CFR § 52.21(o), Allegheny Energy Center provided a satisfactory analysis of the impairment to visibility, soils, and vegetation that would occur as a result of Allegheny Energy Center's facility and general commercial, residential, industrial, and other growth associated with Allegheny Energy Center's facility.

In accordance with 40 CFR § 52.21(p), written notice of Allegheny Energy Center's proposed facility has been provided to the Federal Land Managers of nearby Class I areas as well as initial screening calculations to demonstrate that the proposed emissions from Allegheny Energy Center's facility would not adversely impact visibility and air quality related values in nearby Class I areas.

A more detailed summary of the air quality modeling analysis is summarized as part of Allegheny Energy Center's Installation Permit Application and in ACHD's "Modeling Review of Invenergy LLC (Invenergy) Proposed Natural Gas Combined-Cycle Power Plant Installation Permit" modeling review document prepared by the Planning and Data Analysis Section.

ALLEGHENY COUNTY REGULATIONS

Allegheny County Regulations (Article XXI - Air Pollution Control Regulations)

In general, the ACHD retains jurisdiction within Allegheny County with full delegation from the EPA to enforce the air quality programs under the CAA. The emission sources presented in this document will comply with applicable ACHD regulations promulgated under Article XXI - Air Pollution Control Regulations. This section highlights the applicable county regulations and citations with regulatory requirements pertinent to the proposed Project and Installation Permit Application.

Article XXI §2101.10 - Ambient Air Quality Standards

This Chapter sets for the basis for the ACHD incorporating, by reference, the National Ambient Air Quality Standards, as part of the standards in §2101.10(a). The Project's demonstration of compliance with the NAAQS is presented in Section 6 of the Installation Permit Application.

RECOMMENDATION:

AEC has shown that the proposed natural gas-fired combined cycle power plant located in Elizabeth Township, Allegheny County meets the requirements of 40 CFR Part 52.21 (related to Prevention of Significant Deterioration), ACHD Article XXI §2102.06 (related to New Source Review), and Best Available Control Technology. In addition to the above recordkeeping, testing, reporting, and federal and state regulations the plan approval incorporates additional requirements that may or may not be addressed in this review. Refer to the plan approval for all requirements pertaining to this project. AEC has also shown that the proposed facility will not cause or contribute to air pollution in violation of the NAAQS, will not impair visibility, soils, and vegetation, and will not adversely affect air quality related values (AQRV), including visibility, in federal Class I areas. Based on this analysis the issuance of a plan approval is recommended.